COURSE SYLLABUS

Uiversity year 2025 - 2026

1. Programme Information

1.1. Higher Education Institution	**„Lucian Blaga" University of Sibiu**
1.2. Faculty	Faculty of Sciences
1.3. Department	Environmental Sciences, Physics, Physical Education and Sports
1.4. Field of study	Biology
1.5. Level of study [1]	Bachelor
1.6. Programme of study	Biology (in English)

2. Details about the course

2.1. Name of course	**Hidrobiology**		Code	FSTI.MFE.BIORO.L.SO.4.2020.E-3.4	
2.2. Course coordinator	Conf. dr. Doru-Stelian Bănăduc				
2.3. Seminar / laboratory coordinator	Conf. dr. Doru-Stelian Bănăduc				
2.4. Year of study[2]	II	2.5. Semester[3]	2	2.6. Evaluation form[4]	E
2.7. Course type[5]	O	2.8. The formative category of the course[6]			S

3. Estimated total time

3.1. Course Extension within the Curriculum – Number of Hours per Week				
3.1.a.Lecture	3.1.b. Seminar	3.1.c. Laboratory	3.1.d. Project	Total
2	-	2	-	**4**
3.2. Course Extension within the Curriculum – Total Number of Hours within the Curriculum				
3.2.a.Lecture	3.2.b. Seminar	3.2.c. Laboratory	3.2.d. Project	Total[7]
28	-	28	-	**56**

Time distribution for individual study[8]	**Hours**
Learning by using course materials, references and personal notes	8
Additional learning by using library facilities, electronic databases and on-site information	3
Preparing seminars / laboratories, homework, portfolios and essays	3
Tutorial activities[9]	2
Exams[10]	3
3.3. Total Individual Study Hours [11] *(NOSI$_{sem}$)*	**19**
3.4. Total Hours in the Curriculum (*NOAD$_{sem}$*)	**56**
3.5. Total Hours per Semester [12] (*NOAD$_{sem}$ + NOSI$_{sem}$*)	**75**
3.6. No. of hours / ECTS	**25**
3.7. Number of credits[13]	**3**

4. Prerequisites (if needed)

4.1. Courses that must be successfully completed first (from the curriculum) [14]	-
4.2. Competencies	-

5. Conditions (wherever applicable)

5.1. For course/lectures [15]	-video projection system
5.2. For practical activities (lab/sem/pr/other) [16]	-laboratory with equipment for the collection and analysis of aquatic communities, physico-chemical analysis of water, video projection system

6. Learning outcomes[17]

Number of credits assigned to the discipline: 3				
Learning outcomes				Credit allocation based on learning outcomes
Crt. no.	Knowledge	Skills	Responsibility and autonomy	
6.1.	The student/graduate describes, defines and discusses fundamental principles in the field of Biology, as well as interdisciplinary aspects (for example: General Ecology, Evolutionism, etc.)	The student/graduate applies working methods using modern instruments/equipment and classic laboratory techniques to perform, design experiments, and appropriately record and analyze the results obtained.	The student/graduate uses his/her own knowledge and experiences to develop the scientific community and society in general by participating in professional and/or community activities	1,5
6.2.	The student/graduate correctly uses and explains the specific terminology used in the field of Biology, the main concepts and laws, the characteristics of biological systems from the perspective of the principles of organization and functioning of living matter	The student/graduate defines, describes, discusses/presents major concepts in the field of Biology	The student/graduate demonstrates responsibility and autonomy in the use of scientific knowledge in the field of Biology, by conducting research, developing or improving concepts, theories, operational methods or products, assuming ethical and professional decisions within the scientific process.	1,5

7. Course objectives (resulted from developed competencies)

7.1. General objective	Substantiation of knowledge regarding the structure of aquatic ecosystems and the processes characteristic of these ecosystems.
7.2. Specific objectives	Students' knowledge of the structural and functional peculiarities of aquatic ecosystems, understanding of biocoenosis – aquatic biotope interactions. Developing students' capacity to study aquatic ecosystems: analysis of biotope indicators, analysis of the structure of aquatic communities, data interpretation. Developing the capacity for analysis, synthesis and systemic approach. Developing the capacity for communication using specific language and concepts.

8. Course description

8.1. Lecture[18]	**Teaching methods**[19]	**Hours**
Lecture 1 Introductory notions: hydrosphere, categories of aquatic ecosystems, areas of study in hydrobiology.	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Lecture 2 Water as a living medium – the physical and chemical properties of pure water	Lecture, explanation, heuristic conversation, catechetical conver.	2
Lecture 3 Characteristics of the aquatic biotope	Lecture, explanation, heuristic conversation, catechetical conver.	2
Lecture 4 Aquatic communities: classification, characterization, adaptations	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Lecture 5 Lotic ecosystems: biotope characteristics, biocenotic characteristics.	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Lecture 6 Lotic continuum; matter cycling and energy flow; the four-dimensional nature of lotic ecosystems.	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Lecture 7 Hyporheic medium	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Lecture 8 Springs – ecological peculiarities	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Lecture 9 - 10 Ecological zoning of running waters	Lecture, explanation, heuristic conversation, catechetical conversation.	4
Lecture 11 -12 Lake ecosystems: biotope characteristics; biocenotic characteristics; matter cycle and energy flow	Lecture, explanation, heuristic conversation, catechetical conversation.	4
Lecture 13 Ponds – ecological peculiarities	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Lecture 14 General notions regarding the ecological assessment of continental aquatic systems	Lecture, explanation, heuristic conversation, catechetical conversation.	2
	Total lecture hours:	**28**

8.2. Practical activities (8.2.a. Seminar[20]/ 8.2.b. Laboratory[21]/ 8.2.c. Project[22])	**Teaching methods**	**Hours**
Act.1 Peculiarities of aquatic ecosystems research. Research stages.	Demonstration, case study, problematization, interactive dialogue	2
Act.2 Taking and preserving water samples for physicochemical analysis	Demonstration, case study, problematization, interactive dialogue	2
Act.3 Determination of physical characteristics of water: temperature, color, transparency, turbidity, suspended solids, pH. Interpretation of results.	Demonstration, case study, problematization, interactive dialogue	2
Act.4 Determination of the chemical characteristics of water: alkalinity, acidity, fixed residue, carbon dioxide. Interpretation of the results.	Demonstration, case study, problematization, interactive dialogue	2
Act.5 Determination of chemical characteristics of water: dissolved oxygen, hardness, calcium, magnesium, chlorides. Interpretation of results.	Demonstration, case study, problematization, interactive dialogue	2

Act.6 Determination of chemical characteristics of water: nitrogen compounds; oxidizable substances. Interpretation of results.	Demonstration, case study, problematization, interactive dialogue	2
Act.7 Plankton: methods od sampling and preservation of samples; qualitative and quantitative analyses.	Demonstration, case study, problematization, interactive dialogue	2
Act.8 - 9 Benthos: methods of sampling and preservation of samples; qualitative and quantitative analysis.	Demonstration, case study, problematization, interactive dialogue	4
Act. 10 Phytophilic community: methods of sampling and preservation of samples; qualitative and quantitative analysis.	Demonstration, case study, problematization, interactive dialogue	2
Act.11-12 Ichthyofauna: sampling and conservation methods; qualitative and quantitative analysis.	Demonstration, case study, problematization, interactive dialogue	4
Act.13 -14 Methods for evaluating river quality – biotic indices (IBB, IBH, IBD), saprobic system (Knöpp Index)	Demonstration, case study, problematization, interactive dialogue	4
Total ore laborator		28

9. Bibliography

9.1. Recommended references	Bănăduc D., 2025, *Hidrobiologie. Note de curs* (format electronic)
	Curtean-Bănăduc A., 2001, *Practicum de hidrobiologie*, Ed. Mira Design, Sibiu
9.2. Additional references	Allan J. D., 1996, *Stream ecology. Structure and function of running waters*, Chapman&Hall
	Bronmark C., Hansson L., 2005, *The biology of Lakes and Ponds*, 2nd ed., Oxford University Press
	Momeu L., Cîmpean M., Battes K.P., 2011, *Hidrobiologie*, Ed. Presa Universitară Clujeană
	Haiduc I., 1996, *Chimia mediului ambiant. Controlul calității apei*, Ed. Universităţii Babeş-Bolyai Cluj-Napoca, Cluj-Napoca
	Wetzel R.G., 2001, *Limnology, Lake and river ecosystems*, Third Edition, Academic Press, San Diego
	Wetzel R, Likens G., 1995, *Limnological Analyses*, Second Edition, Springer – Verlag, New York, Berlin, Heidelberg, London, Paris, Tokyo, Hong Kong, Barcelona, Budapest..

10. Conjunction of the discipline's content with the expectations of the epistemic community, professional associations and significant employers of the specific study program [23]

The professional skills obtained by students through completing course hours and practical applications and developing assignments in this discipline are in line with the requirements of the administrative structures responsible for water resources management (Regia Apele Române – SGA, APM, AJVPS) and consulting firms in the field of environmental protection.

11. Evaluation

Activity type	11.1 Evaluation criteria	11.2 Evaluation of methods		11.3 Percentage in the final grade	Notes [24]
11.4a Exam / Coloquium	• Theoretical and practical knowledge acquired (quantity, correctness, accuracy)	Tests during the semester[25]:	10%	60% (minim 5)	
		Homeworks	30%		
		Other activitiesi[26]:	%		
		Final evaluation:	20% (min. 5)		

11.4b Seminar	● Frequency/relevance of participation or responses	Evidence of participation, portofolio of papers (reports, scientific summaries)	-	
11.4c Laboratory	● Knowledge of the equipment, how to use specific tools; evaluation of tools, processing and interpretation of results	● Oral exam ● Written questionaire ● Laboratory notebook, experimental works, reports, etc. ● Practical demonstration	40% (minim 5)	
11.4d Project	● The quality of the project, the correctness of the project documentation, the appropriate justification of the chosen solutions	● Self-evaluation, project presentation ● Critical evaluation of a project	-	
11.5 Minimum performance standard[27] – obtaining a grade of 5 on the written exam; – obtaining an average of 5 for the assignments received throughout the semester; – obtaining an average of 5 for laboratory activities. Definition of categories of aquatic ecosystems. Knowledge of basic notions regarding the aquatic biotope, adaptation of organisms to the aquatic environment, classification of aquatic communities, structure and functions of aquatic communities. General notions regarding the ecological assessment of aquatic systems.				

The Course Syllabus will encompass components adapted to persons with special educational needs (SEN – people with disabilities and people with high potential), depending on their type and degree, at the level of all curricular elements (skills, objectives, contents, teaching methods, alternative assessment), in order to ensure fair opportunities in the academic training of all students, paying close attention to individual learning needs.

Filling Date: |_1_|_1_| / |_0_|_9_| / |_2_|_0_|_2_|_5_|

Department Acceptance Date: |_1_|_7_| / |_0_|_9_| / |_2_|_0_|_2_|_5_|

	Academic Rank, Title, First Name, Last Name	**Signature**
Course Teacher	Assoc. Prof. Doru Bănăduc, PhD	
Study Program Coordinator	Assoc. Prof. Ana-Maria Benedek-Sîrbu, PhD	
Head of Department	Lecturer Ioan Tăușan, PhD	

[1] *Bachelor / Master*
[2] *1-4 pentru licență, 1-2 pentru master*
[3] *1-8 pentru licență, 1-3 pentru master*
[4] *Examen, colocviu sau VP A/R – din planul de învățământ*
[5] *Regim disciplină: O=Disciplină obligatorie; A=Disciplină opțională; U=Facultativă*
[6] *Categoria formativă: S=Specialitate; F=Fundamentală; C=Complementară; I=Asistată integral; P=Asistată parțial; N=Neasistată*
[7] *Este egal cu 14 săptămâni x numărul de ore de la punctul 3.1 (similar pentru 3.2.a.b.c.)*
[8] *Liniile de mai jos se referă la studiul individual; totalul se completează la punctul 3.37.*
[9] *Între 7 și 14 ore*
[10] *Între 2 și 6 ore*
[11] *Suma valorilor de pe liniile anterioare, care se referă la studiul individual.*
[12] *Suma (3.5.) dintre numărul de ore de activitate didactică directă (NOAD) și numărul de ore de studiu individual (NOSI) trebuie să fie egală cu numărul de credite alocat disciplinei (punctul 3.7) x nr. ore pe credit (3.6.)*
[13] *Numărul de credit se calculează după formula următoare și se rotunjește la valori vecine întregi (fie prin micșorare fie prin majorare*

$$\text{Nr.credite} = \text{NOCpSpD} \times \text{CC} + \text{NOApSpD} \times \text{CA} \quad \text{TOCpSdP} \times \text{CC} + \text{TOApSdP} \times \text{CA} \times 30 \text{ credite}$$

Unde:

- NOCpSpD = Număr ore curs/săptămână/disciplina pentru care se calculează creditele
- NOApSpD = Număr ore aplicații (sem./lab./pro.)/săptămână/disciplina pentru care se calculează creditele
- TOCpSdP = Număr total ore curs/săptămână din plan
- TOApSdP = Număr total ore aplicații (sem./lab./pro.)/săptămână din plan
- C_C/C_A = Coeficienți curs/aplicații calculate conform tabelului

Coeficienți	Curs	Aplicații (S/L/P)
Licență	2	1
Master	2,5	1,5
Licență lb. străină	2,5	1,25

[14] *Se menționează disciplinele obligatoriu a fi promovate anterior sau echivalente*
[15] *Tablă, videoproiector, flipchart, materiale didactice specifice, platforme on-line etc.*
[16] *Tehnică de calcul, pachete software, standuri experimentale, platforme on-line etc.*
[17] *Rezultatele învățării se vor menționa în funcție de standardele specifice ale Comisiilor de specialitate ARACIS (https://www.aracis.ro/ghiduri/)*
[18] *Titluri de capitole și paragrafe*
[19] *Expunere, prelegere, prezentare la tablă a problematicii studiate, utilizare videoproiector, discuții cu studenții (pentru fiecare capitol, dacă este cazul)*
[20] *Discuții, dezbateri, prezentare și/sau analiză de lucrări, rezolvare de exerciții și probleme*
[21] *Demonstrație practică, exercițiu, experiment*
[22] *Studiu de caz, demonstrație, exercițiu, analiza erorilor etc.*
[23] *Legătura cu alte discipline, utilitatea disciplinei pe piața muncii*
[24] *CPE – condiționează participarea la examen; nCPE – nu condiționează participarea la examen; CEF - condiționează evaluarea finală; N/A – nu se aplică*
[25] *Se va preciza numărul de teste și săptămânile în care vor fi susținute.*
[26] *Cercuri științifice, concursuri profesionale etc.*
[27] *Se particularizează la specificul disciplinei standardul minim de performanță din grila de competențe a programului de studii, dacă este cazul.*